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L3: Entry 5 of 10

File: USPT

May 4, 1993

US-PAT-NO: 5208095

DOCUMENT-IDENTIFIER: US 5208095 A

TITLE: Laminated glazing unit

DATE-ISSUED: May 4, 1993

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Nietering, Kenneth E.	Dearborn	MI	N/A	N/A

US-CL-CURRENT: 428/215, 219/203, 296/84.1, 359/359, 359/580, 428/216, 428/334,  
428/336, 428/426, 428/432, 428/433, 428/434, 428/436, 428/437, 428/699, 428/701

## CLAIMS:

## I claim:

1. An electrically heatable windshield for a motor vehicle comprising a glass substrate ply, a polyvinyl butyral laminating ply laminated to a surface of the substrate ply, a substantially transparent, electrically conductive coating on the laminated surface of the substrate ply, and means for passing an electrical current through the coating for heating the windshield, the coating consisting essentially of, in order: a first film of dielectric material immediately adjacent the laminating ply; a first film of silver metal; and a film of zinc oxide immediately adjacent the substrate ply; wherein the first film of dielectric material consists essentially of:

a layer of silicon dioxide about 2 to 10 nanometers thick immediately adjacent the laminating ply; and

a layer of zinc oxide immediately adjacent the silicon dioxide on one side and the film of silver metal on the other, being substantially as thick as the film of zinc oxide.

2. A motor vehicle window comprising a glass substrate ply having a surface laminated to a polyvinyl butyral laminating ply and a substantially transparent, electrically conductive solar load reduction coating on the surface of the substrate ply, sandwiched between the substrate ply and the laminating ply, the solar load reduction coating consisting essentially of, in order, a first film of dielectric material immediately adjacent the laminating ply, a first film of silver metal, a film of zinc oxide, a second film of silver metal, and another film of zinc oxide immediately adjacent the substrate ply, wherein the first film of dielectric material consists essentially of:

a layer of silicon dioxide about 2 to 10 nanometers thick immediately adjacent the polyvinyl butyral laminating ply; and

a layer of zinc oxide immediately adjacent the silicon dioxide on one side and the first film of silver metal on the other, being substantially as thick as the film of zinc oxide immediately adjacent the substrate ply.

3. The motor vehicle windshield of claim 2 wherein the first and second films of silver metal each is about 7 to 9 nm thick, the layer of zinc oxide in the first film of dielectric material and the film of zinc oxide immediately adjacent the substrate ply each is about 28 to 42 nm thick, and the film of zinc oxide sandwiched between the first and second films of silver metal is about 60 to 100 nm to thick.

4. The motor vehicle windshield of claim 2 further comprising means for passing an electrical current through the solar load reduction coating to heat the window.

5. The motor vehicle windshield of claim 2 wherein said solar load reduction coating is a Fabry-Perot interference filter having substantially lower transmittance of IR wavelength radiation than of visible light.

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L3: Entry 4 of 10

File: USPT

Jul 20, 1993

US-PAT-NO: 5229205

DOCUMENT-IDENTIFIER: US 5229205 A

TITLE: Laminated glazing unit having improved interfacial adhesion

DATE-ISSUED: July 20, 1993

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Nietering, Kenneth E.	Dearborn	MI	N/A	N/A

US-CL-CURRENT: 428/336, 359/578, 359/580, 359/582, 428/426, 428/432, 428/433,  
428/457, 428/469, 428/480, 428/630, 428/632, 428/688, 428/699, 428/701, 428/702

## CLAIMS:

## I claim:

1. A motor vehicle glazing unit comprising a PVB laminating ply sandwiched between two glass plys, a substantially transparent, electrically conductive film stack at an interface between the PVB laminating ply and one of the two glass plys, and means for passing an electrical current through the film stack to heat the windshield, the film stack consisting essentially of a tantalum pentoxide dielectric film about 35 to 50 nm thick adjacent the PVB laminating ply, an adhesion film of copper or zinc about 1 to 4 nm thick over the tantalum pentoxide dielectric film, a silver metal film about 7 to 12 nm thick over the adhesion film; a second adhesion film of copper or zinc about 1 to 4 nm thick over the silver metal film; and a second dielectric film of tantalum pentoxide about 35 to 50 nm thick over the second adhesion film.
2. A laminated glazing unit comprising a glass substrate ply having a surface, a polymeric laminating ply, and a substantially transparent solar load reduction coating on the surface of the substrate ply laminated between the glass substrate ply and the polymeric laminating ply, the coating consisting essentially of, in order, a tantalum pentoxide dielectric film adjacent the polymeric laminating ply, an adhesion film of copper or zinc, a first film of silver metal, a second dielectric film, a second film of silver metal, and a third dielectric film adjacent the substrate ply and means for passing an electrical current through the solar load reduction coating to heat the window.

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L3: Entry 9 of 10

File: USPT

Nov 26, 1985

US-PAT-NO: 4555434

DOCUMENT-IDENTIFIER: US 4555434 A

TITLE: Anti-glare glass pane for a vehicle

DATE-ISSUED: November 26, 1985

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Kunert; Heinz	Cologne	N/A	N/A	DEX

US-CL-CURRENT: 428/194, 219/547, 219/552, 296/96.19, 428/195, 428/212, 428/218,  
428/426, 428/432, 428/433, 428/434, 428/437

## CLAIMS:

## I claim:

1. Anti-glare glass pane for a windshield of a vehicle having a front hood where said pane has a main area of a field of vision and a secondary area of a field of vision beneath said main area and which is less transparent than said main area; characterized in that a lower portion of the secondary area is in the shape of a downwardly curved concave band having an upper substantially center portion extending upwardly towards the top of the pane and lower side portions curved downwardly towards the bottom and both sides of the pane, in that the degree of transparency of the secondary area increases gradually from the bottom thereof towards the top, in that said lower portion of the secondary area has light transmission of the visible spectrum in the range of 30 to 50%, in that an upper portion of the secondary area positioned between the bottom portion and the main area of vision has a light transmission of the visible spectrum in the range of 50-80%, and in that said upper portion is positioned along a line of sight adapted to extend from the eye level of the operator of the vehicle to an area of a roadway 10-20 m ahead of the vehicle.
2. Anti-glare glass pane according to claim 1 further characterized in that said upper portion has the characteristics of a neutral gray filter.
3. Anti-glare glass pane according to claim 1 further characterized in that the properties of transparency to the visible spectrum are derived from layers of metal coatings vaporized on the surface of said pane.
4. Anti-glare glass pane according to claim 1 further characterized in that the properties of transparency to the visible spectrum are derived from layers pressed into a part of the pane.
5. Anti-glare glass pane according to claim 1 further characterized in that the properties of transparency to the visible spectrum are derived from layers which are electrically conductive and having in addition current supply rails for the purpose of heating said pane.
6. Anti-glare glass pane according to claim 1 further characterized in that the pane is laminated and in that said secondary area includes a separate plastic foil which is dyed to reduce transmission of the visible spectrum.
7. Anti-glare glass pane for a windshield of a vehicle where said pane has a main area of a field of vision which is more transparent than a lower secondary area of a field of vision, said lower secondary area comprising 35 to 45% of the total height of said pane and formed by an upper and lower portion, said upper portion positioned between the main area and said lower portion along a line of sight adapted to extend from the eye level of an operator of said vehicle, said upper portion having a light transmission in the visible spectrum in the range of 50 to 80%, and said lower portion having a light transmission in the visible spectrum in the range of 30 to 50%, said pane further characterized in that the bottom edge of

the main area is curved downwardly substantially from a middle portion thereof towards the lower and side portions of the pane where the side portions of the pane will have a greater transparency than a middle portion of the pane of equal height.

8. Anti-glare glass pane according to claim 1 further characterized in that the upper edge of the lower portion of the secondary area is limited throughout its length by a line of sight extending from the operator and tangent to the upper edges of the front hood.

9. Anti-glare glass pane according to claim 8 wherein said band is asymmetrically positioned with respect to said pane with the curve of the upper edge of the band having a greater degree of curvature on the operator's side of the vehicle than the degree of curvature on the non-operator's side of the vehicle and where the uppermost portion of the band is positioned on the operator's side of the vehicle.